ASSESSMENT OF IMPACTS OF PROPOSED OCS ACTIVITIES ON LONG ISLAND'S SHORELINE RECREATION INDUSTRY

1ST OCS YEAR

(Task 8.8)

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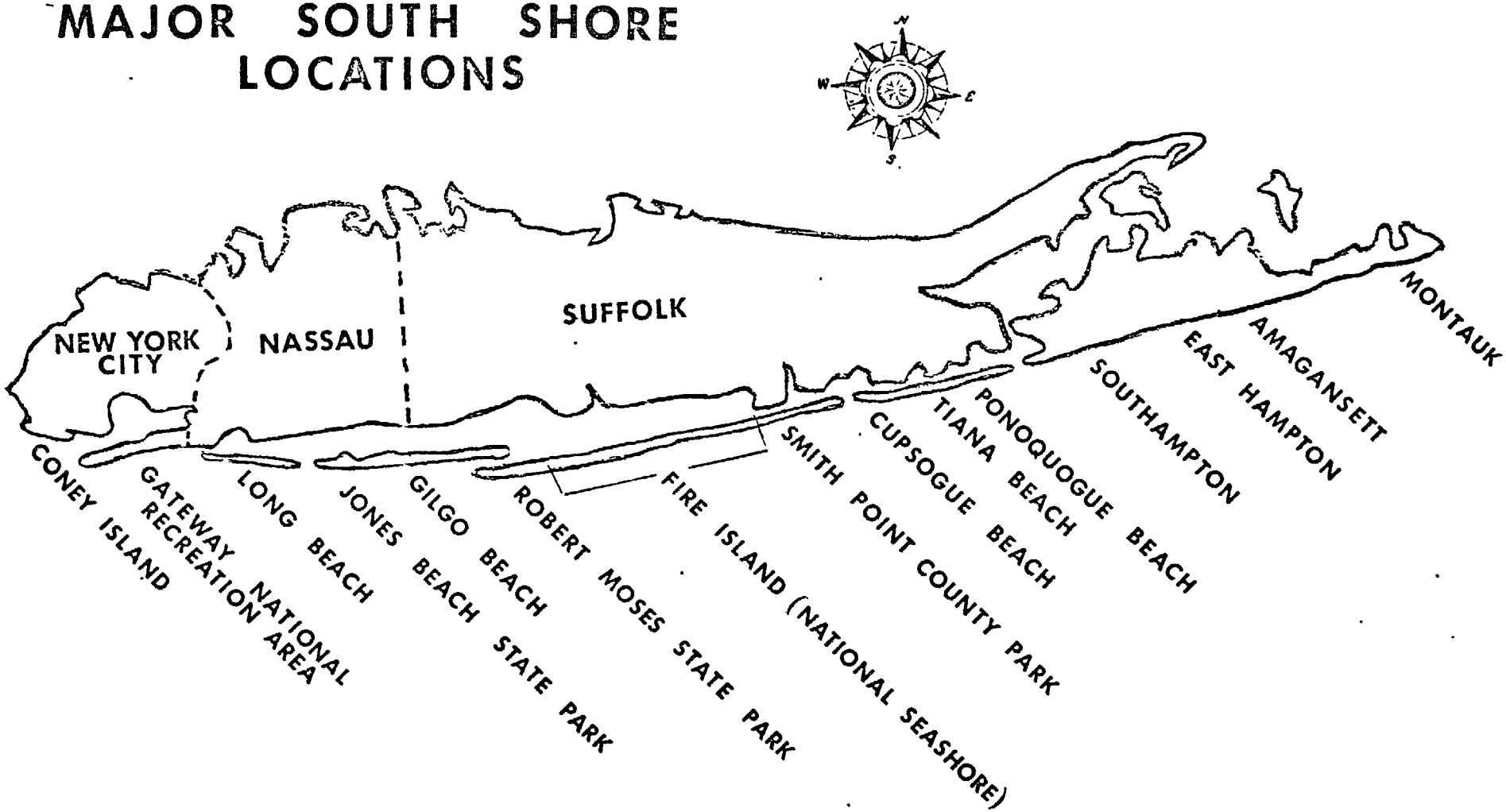
Table of Contents

MAJOR SOUTH SHORE LOCATIONS



Introduction

Long Island is approximately 130 miles long and incorporates the diverse populations of two New York City Boroughs (Brooklyn and Queens) and Nassau and Suffolk Counties. The 1970 population for Brooklyn & Queens was 2.6 million and 1.90 million,respectively. Nassau and Suffolk had a combined population of approximately 2.7 million people, with an average per capita income of $6,670 in 1975. These counties also account for 10% of the State's employment and approximately 15% of the State's personal income.

The history of these two counties dates back to the 1600's and displays a pattern of steady growth paralleling the development of industries dependent upon the region's natural resources. Both Long Island Sound and, more importantly, the Atlantic Ocean, are essential to the region's most lucrative industry---tourism and recreation. Originally a recreation and leisure time center for the very rich, Long Island developed into a nationally known tourist center as the region underwent its most intensive period of development after World War II and on into the present decade. The continued development of shoreline facilities and access roads has further strengthened the region's economic backbone by stimulating an ever-increasing flow of vacationers and day visitors. Leisure related employment in Nassau and Suffolk is estimated at approximately 67,500, or 8½% of the total full-time employment level of 791,500.

The current annual regional product of Nassau and Suffolk Counties is estimated at $19.6 billion. Of this some $1.42 billion are generated by marine-related recreational and tourist spending. Tourist dollars,

those attributed to persons visiting Long Island for periods of at least two days, contribute some $416 million annually. Area residents spend about $917 million, an average per capita expenditure of $340. A significant portion of the region's income (6.8%) may be traced to annual spending in the recreation-oriented activities listed in Table 1.

TABLE 1

Annual Marine-Related Recreational Spending on Long Island (millions of dollars)

Recreation Component	Direct Spending	Total Annual Contribution to Regional Economy *
Tourism & Beach Visitation[1]	$257.3	$ 733.4
Boating[2]	96.0	274.0
Sports Fishing[3]	84.5	240.8
Private Club Membership	60.0	171.0
TOTALS	$497.8	$1419.2

*NOTE: The above figures represent recreation and tourism spending after a regional spending multiplier of 2.85 has been applied to base figures.

1. Marine Midland Survey, 1975.
2. National Boating Industry Magazine, 1976
3. The Urban Sea, and Current Fisheries Statistics.

Tourism and Recreation, stand to be significantly affected by proposed oil and gas development operations on the Outer Continental Shelf (OCS). The Office of Parks and Recreation has been given the task of identifying the potential negative impacts of OCS activities on regional marine-related recreation demand.

The study approached the problem by first naming four activities as the components of recreation and estimating revenues generated in the region through spending on Tourism/Beach Visitations, Boating, Sports Fishing, and Private Clubs. By applying a spending multiplier of 2.85, the projected regional earnings from ocean-related recreational activities were found to be $1.42 billion.

The multiplier represents the number of times money spent is re-spent within the economy over a period of time. The multiplier of 2.85 means that each dollar spent will ultimately contribute $2.85 to the regional economy.

The second phase divided Long Island into five Coastal Recreation Sectors (CRS). A detailed inventory of beaches, marine facilities, fishing centers, and tourist accommodations was taken for each Sector. Using attendance figures and data from the recreational components, it was then possible to allocate monies generated by the above activities to each sector. The analysis revealed that while The East End stimulates the largest amount of recreational spending, the most heavily utilized Sector is the State Park Region.

The oil spill scenarios were created by hypothesizing medium and large spills at five locations along an established tanker route. The marine transport of oil poses a serious threat to the region's marine-related recreation and tourist industry. Proposed OCS development operations in both the Baltimore Canyon and Georges Bank Troughs may include the tankering of large quantities of crude oil from the drill sites to refineries located in the Port of New York and New Jersey. The routes to be utilized pass as close as 5 miles off the Long Island Coast, and one of them, The Ambrose-Nantucket Route, follows the Island's south shoreline at distances ranging from 5 to 30 miles. Approximately eight hundred tankers currently use this route annually, presenting serious threats of oil spills even without OCS development.

Hypothetical spill trajectory studies conducted for the Nassau-Suffolk Regional Planning Board indicate that oil spills occurring at random points along the Ambrose-Nantucket route during the summer months will very likely wash ashore Long Island beaches within a period of two to ten days.

An evaluation of potential negative impacts on coastal recreation identifies both economic and social costs. Economic costs are measured in terms of reduced spending which results from changes in recreation demand.

Adverse effects on recreational spending were estimated by setting losses at 10, 20, and 30% for spill damages lasting from one to four weeks.

In this context, potential weekly losses to the regional economy range from $423,000 to $13.3 million, depending on the size, location, and time of the spill.

Social costs are measured in terms of lost recreation opportunities to tourists and area residents as a result of beaches being closed due to oil pollution. Because of the limited length of Long Island's ocean bathing season, an oil spill could seriously diminish the recreational benefits offered by the beaches and, therefore, reduce the value of recreation experiences on Long Island.

PROPOSED OCS OPERATIONS RELEVANT TO LONG ISLAND

Proposed federal action involves the leasing of designated tracts located in the North and Mid-Atlantic outer continental shelf areas known as the Georges Bank and Baltimore Canyon Troughs, respectively. Because of New York State's geographical location between these two leasing areas, Long Island could be significantly affected by exploration and development operation in each area.

BALTIMORE CANYON

A major lease sale of some 93 nine-square-mile tracts in the Baltimore Canyon area was held in August, 1976, with over $1.1 billion in bids by the major oil companies accepted by the U. S. Interior Department. However, litigation involving the validity of these leases has effectively served to put a halt to exploratory development operations.

Lease sales in the Baltimore Canyon include tracts offshore New Jersey and Delaware. The proximity of this area to the mainland and estimated recoverable resource make it economically feasible to transport oil and gas finds ashore by pipeline. Peak daily production of oil is projected to be about 320,000; of which approximately one-half is expected to be refined at facilities located within the Port of New York and New Jersey.[1]

The distance between the Baltimore Canyon lease area and Long Island is a minimum of seventy miles. Oil tankered into the Port of New York and New Jersey will bypass the Island, and there are presently no known plans to acquire or develop land in Nassau or Suffolk Counties for OCS industrial or support purposes. Beneficial economic impacts on Long Island resulting from Baltimore Canyon development operations are expected to be minimal.

1. U.S. Department of the Interior, Bureau of Land Management, Environmental Impact Statement, Lease Sale 40

The risk of tanker spills during the transport of oil to the mainland is considerable. Hypothetical spillage during the lifetime of the Baltimore Canyon find could range between 1.67 and 10.8 million barrels.[1] The risk most detrimental to Long Island's shoreline is that of a moderate-to-large spill occurring at or near the northern terminus of the Hudson Canyon-Ambrose sea lane, which connects the lease area with the Port of New York and New Jersey.

Georges Bank

Located in the North-Atlantic region, at a minimum distance of some 130 miles east of Montauk Point, the Georges Bank Basin is the site of another proposed lease sale on the outer continental shelf. Although the actual lease sale has not yet taken place, there has been much speculation as to the potential effects of oil and gas development on New England, Long Island, and adjacent fishing grounds used by international fleets.

Best estimates now indicate that the amount of oil recoverable will be insufficient to justify construction of a pipeline. However, pipelines will utilized for transport of natural gas because of the high cost of processing and transport at the platform. Since no refineries exist in New England, it is expected that much of the Georges Bank oil will be refined at existing facilities located in the Port of New York and New Jersey, which have a capacity of some 450,000 barrels per day. This oil would be tankered from the drill site to the Port via the Ambrose-Nantucket Sea Lane, which passes

1. Environmental Impact Statement, Lease Sale 40

within ten miles of Long Island, south of Robert Moses State Park.

Studies involving the release of numerous float cards in Long Island waters concluded that spills occurring approximately fifteen miles from shore would strand on the beaches within ten days. Certain cards released inside the sea lane reached Long Island within two days, indicating that oil spilled by tankers could strand on Long Island beaches in an extremely toxic (unweathered) state.

It appears that operations on Georges Bank will spur little economic activity on Long Island. Major supply facilities will be maintained at Quonset Point, Rhode Island, and possibly, New Bedford. Long Island stands to realize little benefit in terms of new jobs or support facility development.

Study Approach

In order to determine the potential economic effects of off-shore drilling on Long Island's recreation industry, it was first necessary to quantify the present level of marine-related recreational activities. This was done by establishing base data on spending and use patterns for the four activities defined as the components of marine-related recreation. These components are: Tourism/Beach Visitation, Boating, Sports Fishing, and Private Club Membership.

Tourism/Beach Visitation

The Nassau/Suffolk region is the State's second most popular tourist area after New York City. The ocean is the single most popular regional attraction, attracting some 38 million visitors annually to Long Island's more than 80 south shore beaches.

Available attendance data reveal that on an average summer day there are approximately 233,000 people recreating on Nassau and Suffolk ocean beaches, spending some $1,554,000.

Beach visitation for residents and tourists is the most important recreation component. It generates over half the total regional recreational spending, as may be seen in Table 1.

Boating

There are over 100,000 registered motor boats and sailboats in Nassau and Suffolk counties. In addition, there are nearly an equal number of non-powered small craft, estimated to be in use in the area. Boating industry figures indicate that sales of boats on Long Island are approximately 2% of national sales.

Marine facilities, identified here as part of the boating component, tota six-hundred and fifty in number, with the majority (416) being located along the south shore. For purposes of this study, "marine facilities" are defined as: marinas, public and private launching ramps, fishing station, and docks.

Marina sizes range from those containing ten boat slips to those with over seven hundred. As shown in Table 1, boating, contributing some $274 Million to the regional economy annually, is the second most important recreational component.

Sports Fishing

Long Island is one of the major sports fishing centers on the Atlantic coast. The Department of Environmental Conservation sets the number of marine anglers at 845,000 per year. Many others participate in more casual fishing activities with a smaller, but still substantial, investment in the activity. Current data indicate that annual per capita fishing expenditures range from $100 to $170. This study estimates that $100 is appropriate for Long Island since the majority of fishing activity does not involve overnight stays. Based on these figures, approximately $240.8 million are generated into the regional economy.

Private Clubs

There are approximately 120 private beach, country, and tennis clubs operating in Nassau and Suffolk Counties. A sample[1] of twelve of these clubs disclosed that the average membership was 250 families, each paying annual membership fees of about $2000.

As shown in Table 1, private clubs on Long Island generate some $171 Million annually into the regional economy.

1. Random survey of 10% of total number of clubs.

DELINEATION OF COASTAL RECREATION SECTORS (CRS's)

The rationale used to divide the Long Island region into sections for purposes of analysis included: geographic boundaries, such as inlets, similar land use patterns; and socio-economic characteristics.

The five areas which emerged from this analysis were designated Coastal Recreation Sectors (CRS's) and are shown on Maps 1A - 1E. They are:

CRS 1: Western Nassau: the shoreline from the Queens-Nassau line to the Jones Inlet.

CRS 2: State Park Region: from the Jones Inlet to Robert Moses State Park.

CRS 3: National Seashore Region: from Robert Moses State Park to the Moriches Inlet.

CRS 4: Westhampton - Tiana Beach: from the Moriches Inlet to the Shinnecock Canal.

CRS 5: The East End: from the Shinnecock Canal to Montauk Point.

It should be noted that these sectors are not autonomous units, but interdependent zones whose social and economic characteristics overlap to a high degree. An aggregation of the data for each of the smaller measurement units (CRS's) results in the most accurate regional base. This methodology also allows a better estimate of potential negative effects by making it possible to focus on a realistic range of beaches and facilities which might be impacted by oil spills.

DESCRIPTIONS OF COASTAL RECREATION SECTORS

Some characteristics relevant to recreation about each CRS are presented in Table 2. The population figures do not include the towns of Huntington, Smithtown, and Southold on the north shore because they are geographically irrelevant. Table 3 indicates relative recreational importance by citing average attendance figures and related spending.

TABLE 2

CRS's South Shore Characteristics

CRS	Miles of Ocean-Front	Number of Beaches	Number of Marine Facilities	Population	% of Long Island Population[1]
1	13	21*	107	464,000	17
2	26	7	120	1,125,000	42
3	31	17	62	396,000	15
4	18	18	56	100,800	4
5	45	29	71	33,600	1

*Includes Long Beach City, which has 32 small beaches, as 1 beach

TABLE 3

Tourism/Beach Visitation and Related Spending

CRS	Average Daily Attendance	Seasonal Attendance	Average Daily Expenditures[2]	Seasonal Expenditures
1	45,000	5.6 million	$ .81	$ 4,520,000
2	89,000	11.0 "	.81	8,939,000
3	22,000	2.7 "	8.00	22,200,000
4	27,000	1.5 "	10.00	33,480,000
5	50,000	6.2 "	20.00	124,000,000
TOTALS	233,000	29.0 million		$192,939,000

1. Excludes population of north shore townships

2. Derived from attendance and revenue data provided by individual facilities.

CRS 1 - WESTERN NASSAU

CRS 1 consists of the shoreline area between Atlantic Beach, near the Queens- Nassau County line, and Point Lookout; a distance of approximately 13 miles. The major beach facilities in this sector are indicated on Map 1A.

This sector contains a variety of beach facilities, ranging from senior citizen homes and local beaches in the western portion, to large Town and County beaches in the east. In the Lido Beach area there formerly stood at least twelve private beach and tennis clubs. There now exist a number of publicly-owned facilities, many utilizing former club-houses and parking areas.

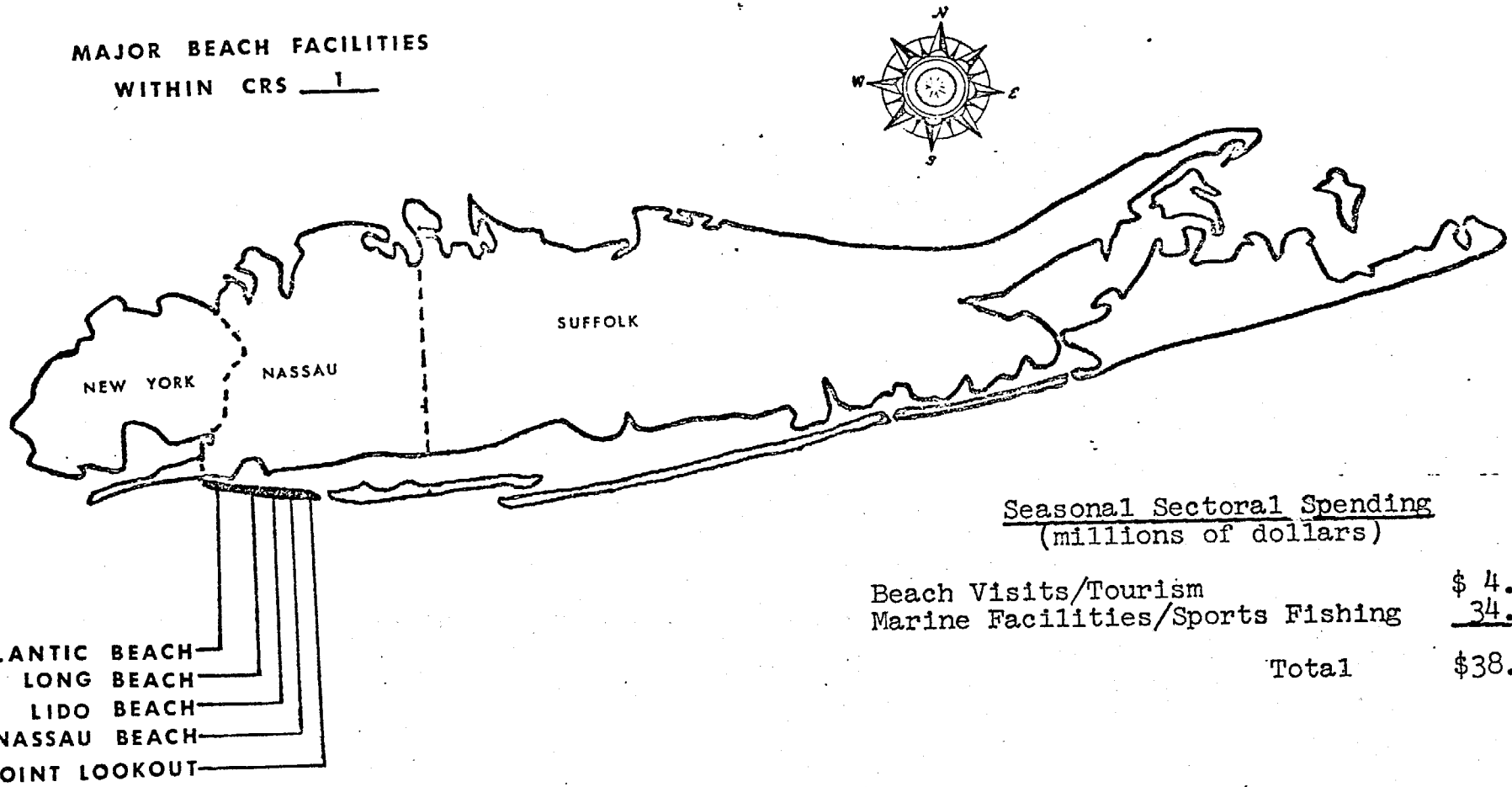
On an average summer day, some 45,000 persons visit the seven ocean beaches in CRS 1, spending approximately $36,450. This low figure (the average per capita daily expenditure is $.81) is primarily due to the large number of low-cost public facilities in the area and their close proximity to most of the sector's beach users.

This CRS ranks second in the number of marine facilities. Most are located on either side of Reynold's Channel, on the sector's mainland side. These facilities account for some $34.3 million annually in recreation-related spending. Total recreational spending in CRS 1 for the 18 week summer season is approximately $38.8 million.

CRS 2 - STATE PARK REGION

Because virtually all of this area's seven ocean beaches are publicly owned, CRS 2's average beach spending is also relatively low. This sector begins at Jones Beach State Park and runs eastward to include Robert Moses State Park, a distance of some 26 miles. (See Map 1B)

MAJOR BEACH FACILITIES
WITHIN CRS 1



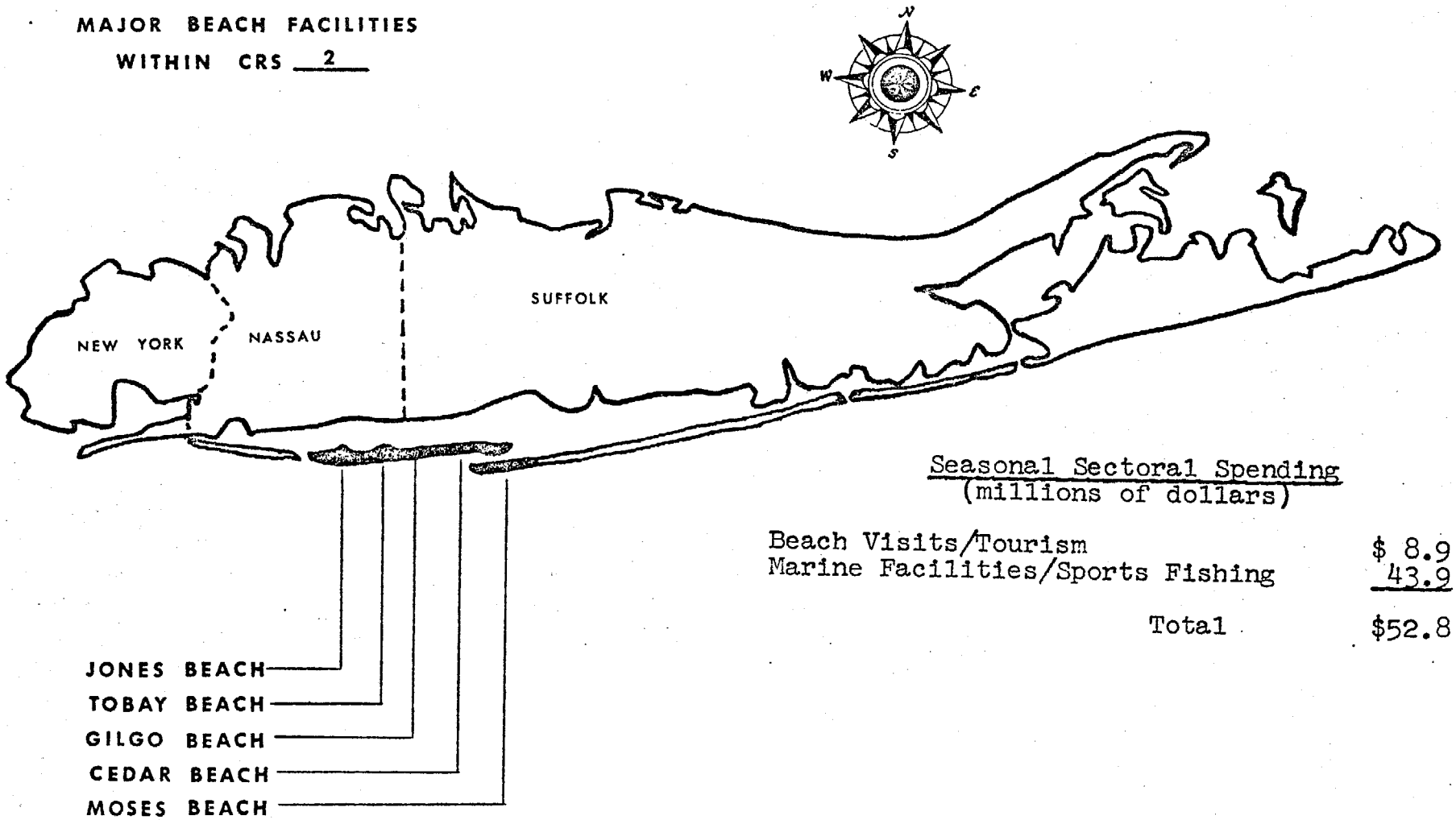
Seasonal Sectoral Spending
(millions of dollars)

Beach Visits/Tourism	$ 4.5
Marine Facilities/Sports Fishing	34.3
Total	$38.8

Map 1A

0 16 32 miles
SCALE

MAJOR BEACH FACILITIES
WITHIN CRS 2



Seasonal Sectoral Spending
(millions of dollars)

Beach Visits/Tourism	$ 8.9
Marine Facilities/Sports Fishing	43.9
Total	$52.8

Map 1B

0 16 32 miles
SCALE

Jones Beach and Robert Moses State Parks are the two most heavily attended beaches in the region. The combined 1976 summer attendance was over 11 million people, who spent almost $ 9 million. The approximate per capita daily expenditure for beach use in CRS 2 is also $.81. (See Table 3)

Beach attendance in all of Sector 2 averaged 89,000 a day in 1976. Despite the presence of two State Parks, much more money was spent on sports fishing and boating endeavors. The sector contains 120 marine facilities and about $43.9 million a year are spent on these activities within the sector. Total recreational spending in CRS 2 for the 18 week summer season is approximately 52.9 Million.

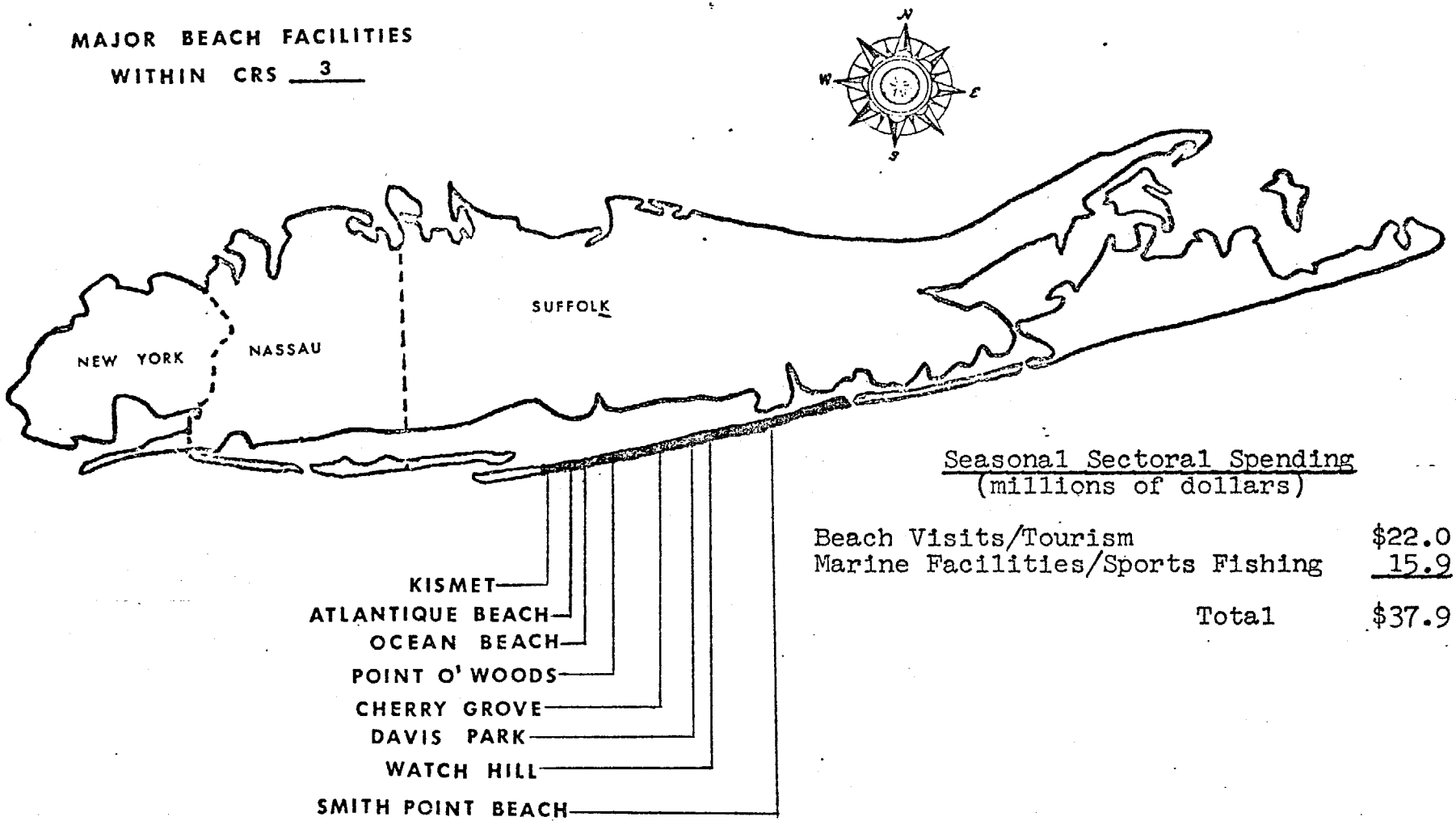
CRS 3 - NATIONAL SEASHORE REGION

CRS 3 is 31 miles long and is made up of the entire Fire Island barrier beach, with the exception of Robert Moses State Park. The majority of recreators at the sector's 17 beaches are owners or rentors of Fire Island's 3600 summer homes (See Map 1C). This area has been designated part of the National Seashore under the jurisdiction of the National Park Service.

Although this sector has the lowest number of seasonal beach visitations (22,000/day), average daily spending is far greater than it is in CRS's 1 and 2. This is primarily due to the resort atmosphere of Fire Island, with its limited accessibility and high rental costs.

It is conservatively estimated that average daily per capita spending is $8.00. Although there are public beaches on Fire Island, access is by boat only and daily expenditures are higher than they would be at other public facilities. Round-trip ferry fares are about $4.00 per person.

MAJOR BEACH FACILITIES
WITHIN CRS 3



Seasonal Sectoral Spending
(millions of dollars)

Beach Visits/Tourism	$22.0
Marine Facilities/Sports Fishing	15.9
Total	$37.9

Map 1C

0 16 32 miles
SCALE

Sixty-two marine facilities are located on the Sector's bay side, and account for over $15.9 million in seasonal recreation expenditures. Total recreation spending in CRS 3 for the 18 week summer season is approximately $37.9 million.

CRS 4 - WESTHAMPTON-TIANA BEACH

CRS 4 includes the 18 miles of shoreline between the Moriches and Shinnecock Inlets, and is almost entirely composed of private and Town beaches (Map 1D). Attendance at the Sector's 18 beach facilities averages approximately 27,000 per day, with an average per capita expenditure of $10.00. These beach visitors reflect a combination of tourists, home owners, and day-trippers.

The largest and most popular beach, Tiana Beach, is operated by Suffolk County and attracts a large number of day visitors.

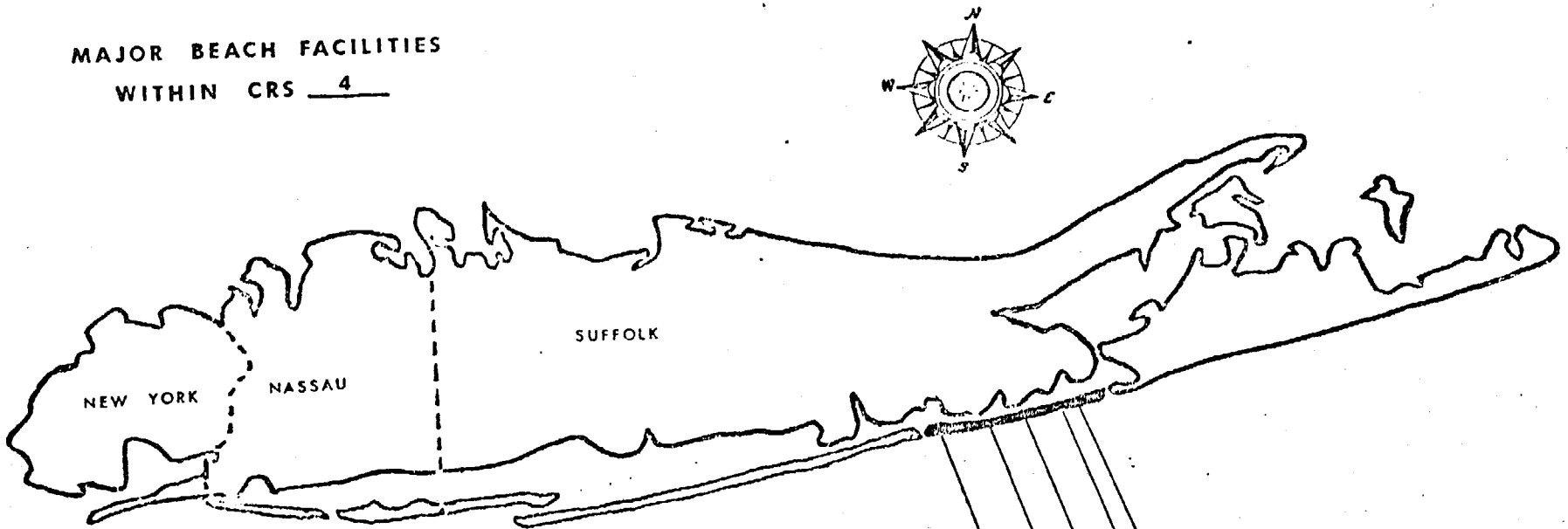
The base population of CRS 4 triples during the summer months, and the relatively high cost of housing is responsible for the average $10/day per capita expenditure.

Use of the 56 marine facilities, located on the mainland side, adds another $18.5 million in revenues to the Sector. Total recreational spending for the summer season is approximately $51.9 million.

CRS 5 - THE EAST END

This sector is made up of the 45 miles of shoreline from the Shinnecock Inlet eastward to Montauk Point (See Map 1E). It contains 29 beaches, including Hither Hills and Montauk Point State Parks, which are visited by some 50,000 persons on an average summer day.

MAJOR BEACH FACILITIES
WITHIN CRS 4

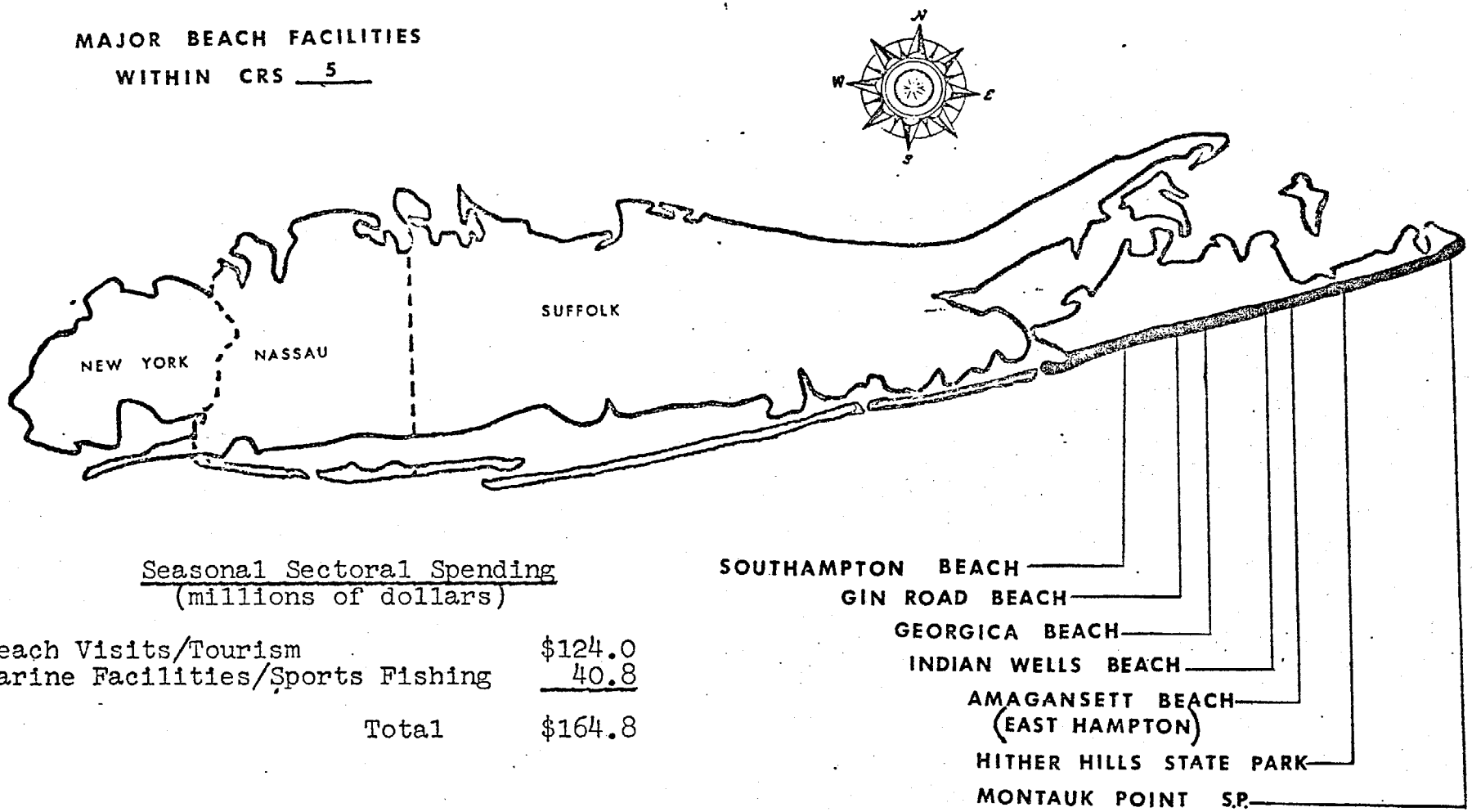


Seasonal Sectoral Spending
(millions of dollars)

Beach Visits/Tourism	$33.5
Marine Facilities/Sports Fishing	18.4
Total	$51.9

Map 10

MAJOR BEACH FACILITIES
WITHIN CRS 5



Seasonal Sectoral Spending
(millions of dollars)

Beach Visits/Tourism	$124.0
Marine Facilities/Sports Fishing	40.8
Total	$164.8

Map 1E

0 16 32 miles
SCALE

Beaches on CRS 5's north shore were included here because of the relative ease of access via Gardiner's and Peconic Bays and the Shinnecock Inlet and Canal.

CRS 5 is easily the most exclusive and "tourist-oriented" of the sectors. Its distance from metropolitan population centers makes visits of less than two days impractical. During the summer months the base population quadruples as a result of the influx of tourists and other summer residents.

Due to the high cost of housing, entertainment, and food, average daily per capita recreation spending in this sector is at least $20.00. Motel and hotel rates range between $60 and $80 per day during the summer, and occupancy rates are usually high. Very often these accommodations are booked for the entire season six months in advance.

Boating and Sports Fishing in CRS 5 account for approximately $40.8 million in revenues during the 18 week season. The sector contains 71 marine facilities, many of which are located in the Lake Montauk area, and is considered a major sports fishing center.

Total recreational spending in CRS 5 for the summer season is approximately $164.8 million.

TABLE 4
(18 Wk. Period)
Summary of Seasonal Spending for 5 CRS's.
(in millions of dollars)

	Beach Visits/Tourism	Marine Fac./Sports Fish.	Total
CRS 1:	$ 4.5	$ 34.3	$ 38.8
CRS 2:	8.9	43.9	52.9
CRS 3:	22.2	15.9	37.9
CRS 4:	33.5	18.4	51.9
CRS 5:	124.	40.8	164.8
TOTAL	$ 193.1	$ 153.3	$ 346.3

BROOKLYN - QUEENS SECTOR

Although this study is primarily concerned with the potential negative effects of OCS operations on marine-related recreation in Nassau and Suffolk Counties, it recognizes the possibility that many New York City facilities could also be impacted by oil spills.

Annual attendance at the ocean beach facilities located in Brooklyn and Queens averages approximately 32 million. Of this, about fifteen million persons visit Coney Island beach alone. The remaining beach visits are distributed among Jacob Riis Park (National Park Service), Rockaway Beach, Manhattan Beach, Brighton Beach, and others. These facilities primarily serve a local population which, although comprising fully two-thirds of Long Island's total population, only occupies about one-seventh of Long Island's land area.

Brooklyn and Queens together contain 70 marinas with a capacity of about 4800 berthings. In addition, there are 27 boat launching sites and fishing stations.

OIL SPILL SCENARIOS

It is generally agreed that transport of outer continental shelf oil resources by tanker presents the greatest single threat of an oil spill and resulting damages to Long Island. Spills occurring at drilling sites, both in the Baltimore Canyon and Georges Bank lease areas, are expected to have little or no direct effect on Long Island due to the distance from these proposed sites.

The Ambrose-Nantucket Sea Lane is the primary east-west tanker route in and out of New York Harbor. Map 2 indicates the location of the route in relation to Long Island, and gives the distance in miles between the northern edge of the route and several points along the Island's ocean shore.

One-third of the total tanker traffic to the Port of New York, utilize the Ambrose-Nantucket route.[1] Proposed OCS operations in the Georges Bank area could foreseeably increase the volume of crude oil being transported along this route for refining and distribution throughout the region. A direct result of this is the increased risk of oil spills of varying magnitudes occurring in the waters adjacent to Long Island, the Port of New York, and northern New Jersey. In order to estimate the range of potential losses to Long Island's marine-related tourist and recreation industry in the event of an oil spill , a set of spill scenarios were developed to project a variety of loss possibilities.

Map 2 also indicates the location of the five hypothetical spill locations (A - E) selected to represent the geographic range of spills most likely to affect Long Island within a 30 day period. These hypothetical spill sites are located as follows:

Spill Locations

Spill A: 40°30' North Latitude
73°40' West Longitude

Spill B: 40°30' North Latitude
73°15' West Longitude

Spill C: 40°30' North Latitude
72°50' West Longitude

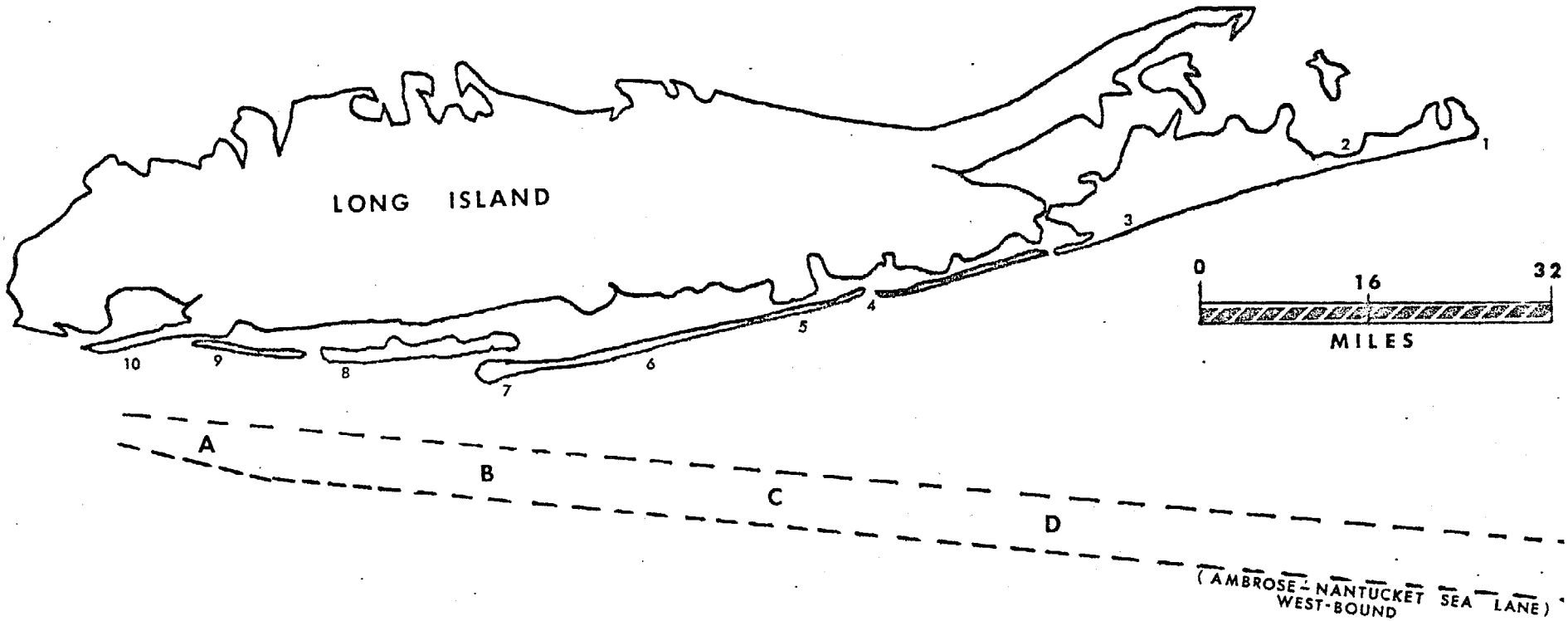
Spill D: 40°30' North Latitude
72°20' West Longitude

Spill E: 40°30' North Latitude
71°30' West Longitude

1. U.S. Coast Guard

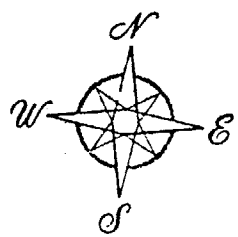
MAP 2

HYPOTHETICAL OIL SPILL LOCATIONS (A-E)



PROXIMITY OF SEA LANE TO POINTS ALONG OCEAN SHORE

1. Montauk Point	- 34 miles	6. National Seashore	- 8 miles
2. Napeague Harbor	- 30 miles	7. Robert Moses State Park	- 7 miles
3. Southampton	- 23 miles	8. Jones Beach State Park	- 7 miles
4. Moriches Inlet	- 18 miles	9. Atlantic Beach	- 7 miles
5. Smith Point Beach	- 14 miles	10. Rockaway Beach	- 6 miles



Oil spills of both medium and large volumes are hypothesized for each site. U. S. Coast Guard standards for volumes of oil spills designated as "medium" or "large" vary for spills occurring at sea or on shore. For this study, the designations of "medium" and "large" were used. A medium spill is projected to be 500-1000 barrels in volume and to impact a twenty mile length of shoreline for a period of one to two weeks; while a large spill would be over 1000 barrels, and would impact a sixty mile length for a period of from one to four weeks.

Each of the hypothetical spills will occur during the second half of June. This time was chosen because, from the point of view of tourist-dependent businesses, late June is the worst time of year for such an occurrence. Many persons planning to visit the shore for vacations or weekends during the season will change their plans and cancel reservations for hotel/motel accommodations or rented cottages. Also, an oil spill occurring in late June would most certainly spoil the usually lucrative July 4th weekend and set the tone for the entire month.

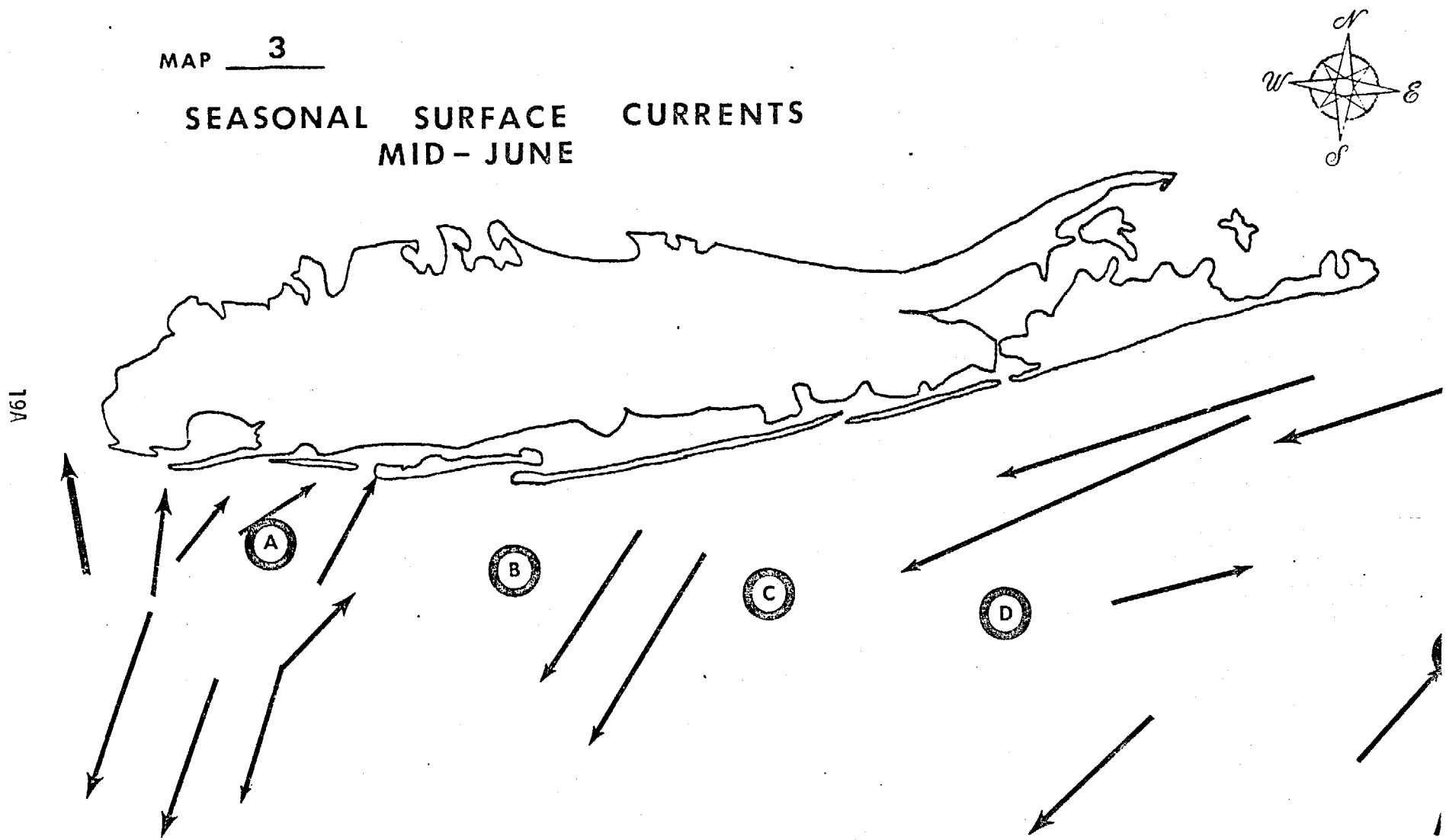
Map 3 indicates June surface currents for the area adjacent to Long Island's south shore in relation to the five hypothetical spill sites. These currents, along with seasonal prevailing winds, are important determinants of where, if at all, spilled oil will wash ashore.

The Nassau-Suffolk Regional Planning Board contracted for spill trajectory studies[1] in which float cards were dropped into the ocean at different points in the nearshore coastal waters. This spill trajectory simulation technique was used to characterize the movement of oil in response to residual currents and surface winds.

1. Long Island Spill Trajectory Study (M.I.T.)
   Probabilistic Trajectory Assessment for Offshore
   Oil Spills Impacting Long Island (M.I.T.)

MAP 3

SEASONAL SURFACE CURRENTS
MID-JUNE



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SOURCE: U.S. Department of the Interior,
Bureau of Land Management, Draft Environmental Statement,
O.C.S. Lease Sale 42

The study, conducted by MIT's Department of Ocean Engineering, indicated that a high percentage of all oil spills originating in the offshore area bounded by 40° N latitude on the south, 71° W longitude on the east, and a line running southeast from Long Beach on the west, will strand on Long Island during at least one season of the year.

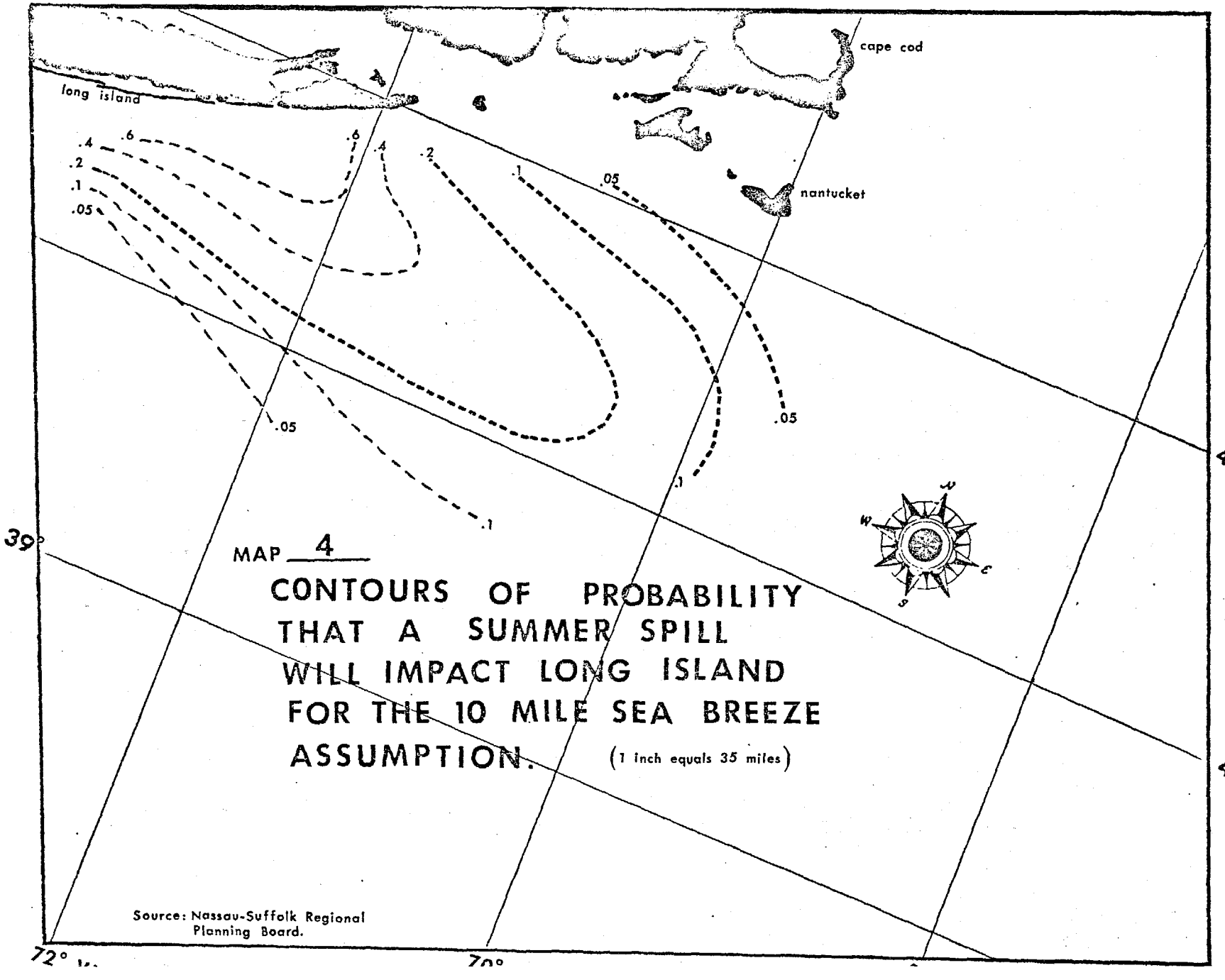
As shown on Map 4, for spills originating in this zone during summer months, the probability of oil stranding on Long Island is between 20% and 60%. The probability of a spill originating at a Georges Bank drill site and reaching Long Island is 5% or less.

The purpose of the spill scenarios is to identify potential economic losses to the Long Island region resulting from a hypothetical spill just prior to the period of peak demand for ocean-related recreational facilities and services. Data on annual visitation and related spending for Long Island's ocean shore has been analyzed for each of the five CRS's. It is possible to project what portion of spending within each CRS will be lost or altered in response to spill-related pollution of area ocean beaches.

Chronic Spills

According to the U.S. Coast Guard and the Environmental Protection Agency, there were some 12,000 reported spills in 1975, dumping over 22 million gallons of oil into U. S. waters. Twenty of these spills accounted for over 16 million gallons of the spillage.

Although nowhere near the size of the spills caused by the breakups of the Torrey Canyon (30million gallons) or the Argo Merchant (7½ million gallons), chronic spills contribute significantly to pollution. They are defined as those oil spills, mostly unpreventable, which occur as normal by-products of day-to-day oil drilling and transport operations.



MAP 4

CONTOURS OF PROBABILITY THAT A SUMMER SPILL WILL IMPACT LONG ISLAND FOR THE 10 MILE SEA BREEZE ASSUMPTION.

(1 inch equals 35 miles)

Source: Nassau-Suffolk Regional Planning Board.

The average size of a chronic spill is 5000 gallons. Many are smaller, but more than a few have been 500 times that size. They include pipeline ruptures; spills occurring during tanker loading/unloading; and routine tank cleansing operations.

The peak volume of Baltimore Canyon and Georges Bank oil transported to Port of New York and New Jersey refineries is projected to exceed 318,000 barrels per day. This is expected to involve an additional 730 round trips per year to the existing Port of New York and New Jersey tanker traffic.

The potential for spill-related damages to the regional marine-oriented recreation industry increases proportionally with the scale of OCS development operations.

Potential Negative Impacts

In developing the spill scenario and estimated losses to the region and recreation industry, three assumptions were made

1. Impacted beaches will be completely closed for periods of one to four weeks.
2. There will be 100% diversion of potential beach users to outside the Nassau/Suffolk area during this period. There will be no money spent by beach visitors in the impacted area.
3. As indicated by the Long Island Waste Pollution Study (OPR, 1976), recreation-related businesses lost from 10% - 30% of seasonal revenues. Losses of 10, 20, and 30% were assumed for the boating and sports fishing components in this study.

The potential revenue losses are, therefore, the sum of 100% loss to the beach component, and from 0 to 30% losses to boating and sports fishing. Estimated weekly losses are given in Table 5A.

Spill A: The first spill is located at 40° 30' North Latitude and 73°40' west Longitude, about 7 to 8 miles from Long Island. As shown on Map 5A, a medium and large spill would impact 20 and 60 miles of coastline, respectively.

The 20 mile impact area would be bound by Atlantic Beach on the west and Cedar Beach on the east. The spill would affect about 197 marine facilities, 13 beaches, and 90,000 beach visits per day for the period of its duration. This represents a potential weekly loss of $423,000 to $890,000.

The 60 mile impact area would extend eastward from Atlantic Beach to the western end of Smith's Point County Park. Approximately 375 facilities, 41 beaches, and 156,000 beach visits/day would be threatened. The range of lost revenues for one week is $2.0 - $3.6 million.

Spill B: This spill would occur at 40°30' North Latitude and 73°15' West Longitude, some 7-8 miles from Long Island, (See Map 5B).

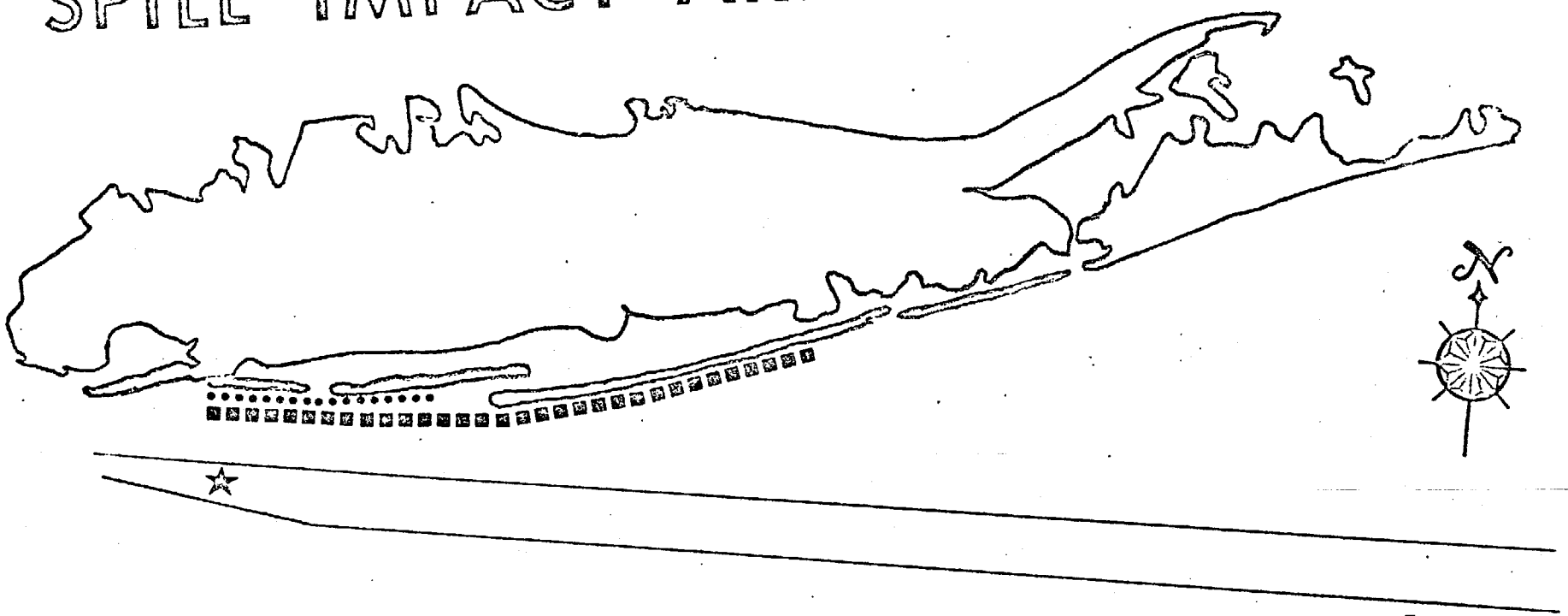
The 20 mile impact area would be from Long Beach in CRS 1 to Gilgo Beach in CRS 2. This would involve 197 marine facilities; 13 beaches, and 100,500 beach visits/day; with loss of $569,00 -$1,150,000 per week.

The 60 mile scenario threatens the area from Atlantic Beach on the west to Smith's Point on the east. This could potentially impact 272 marine facilities, 28 beaches, and 150,000 beach visits/day. A week's loss to recreation components could be from $1.7 to$3.1 Million.

Spill C: The location of this spill is placed at 40°30' North Latitude and 72°50' West Longitude, approximately 8-9 miles from Long Island (see Map 5C).

MAP 5A

SPILL IMPACT AREAS



KEY

☆ SPILL LOCATION

••••••• MEDIUM SPILL IMPACT AREA

▪▫▪▫▪ LARGE SPILL IMPACT AREA

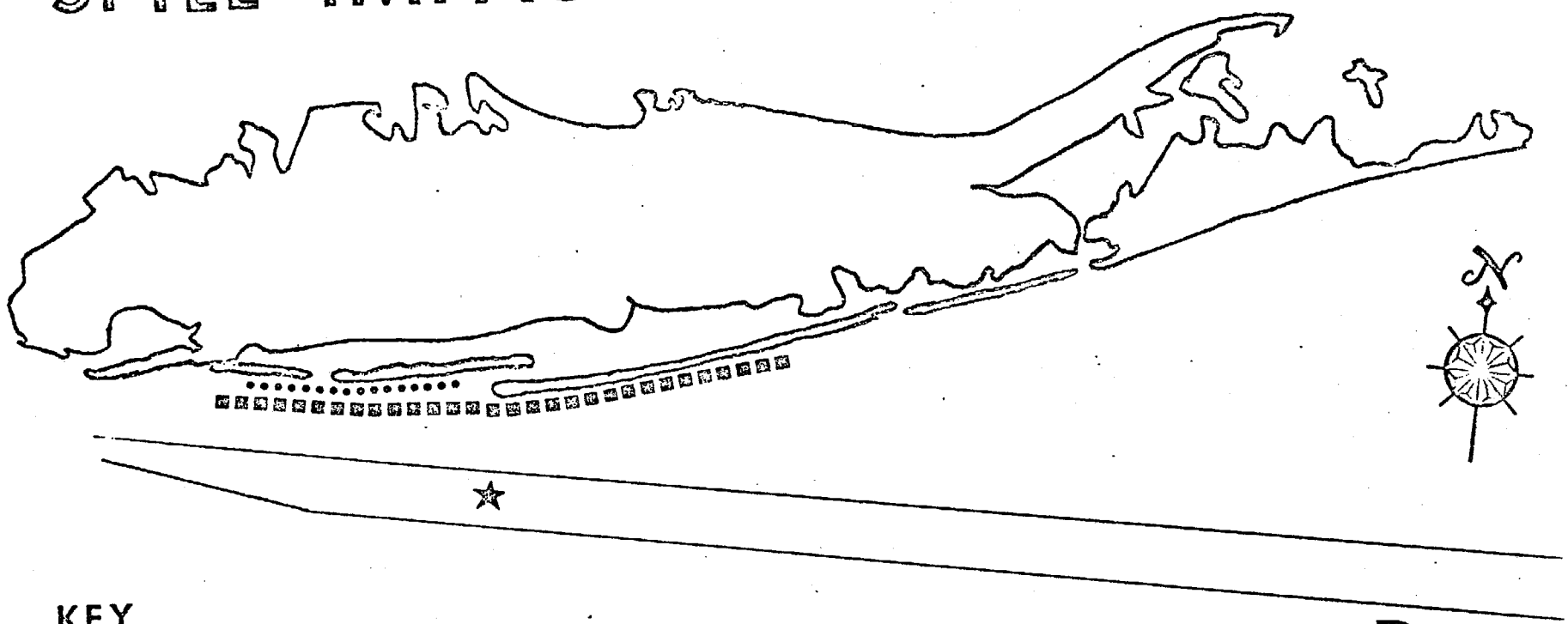
SPILL NO. A

0 16 32

MILES

MAP 5B

SPILL IMPACT AREAS



KEY

☆ SPILL LOCATION

••••••• MEDIUM SPILL IMPACT AREA

▪▫▫▫▫ LARGE SPILL IMPACT AREA

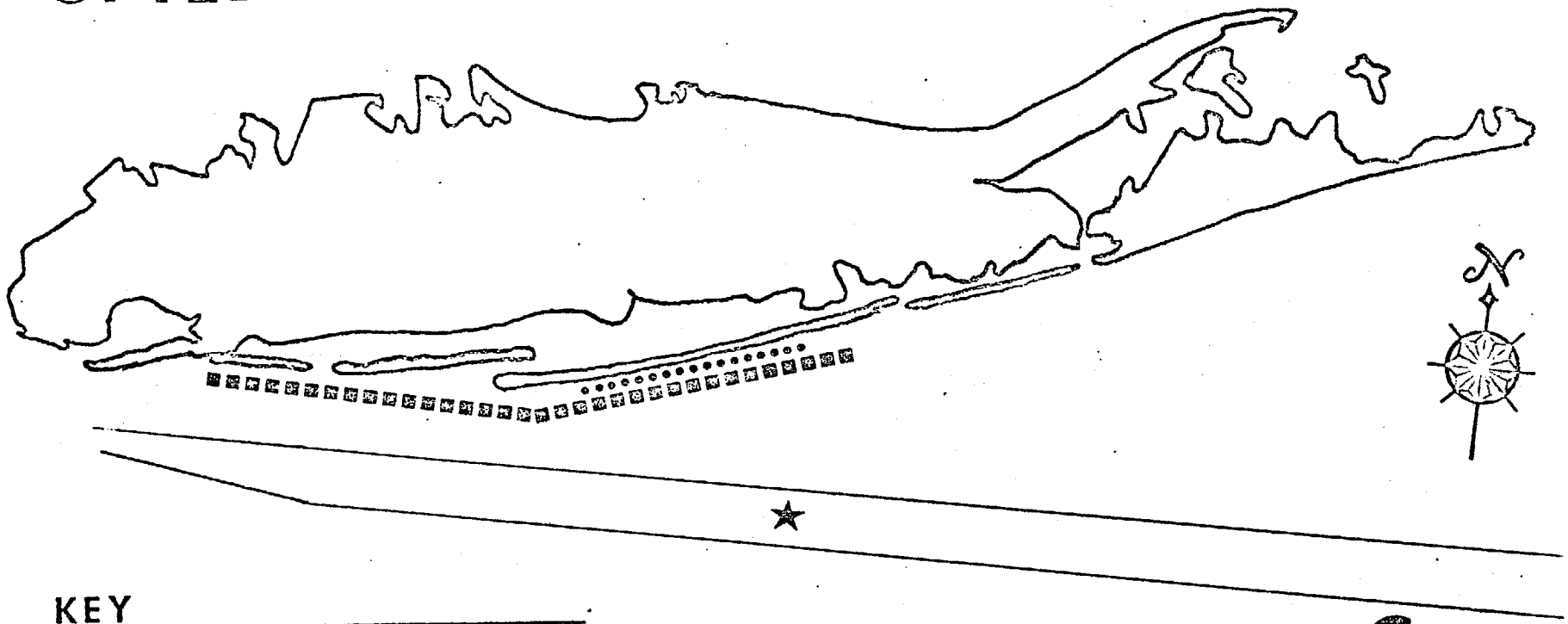
SPILL NO. B

0 16 32

MILES

MAP 5c

SPILL IMPACT AREAS



KEY

☆ SPILL LOCATION

••••••• MEDIUM SPILL IMPACT AREA

▪▫▪▫▪ LARGE SPILL IMPACT AREA

SPILL NO. C

0 16 32

MILES

The 20 mile spill area includes Robert Moses State Park on the west to the western end of Smith's Point Park on the east. The potential weekly revenue loss to 45 marine facilities, 12 beaches, and 16,500 beach visitations is estimated at $1.2 -$1.7 Million.

The affected area for the large spill would extend from Atlantic Beach to Smith's Point Park. This would impact 272 marine facilities, 28 beaches, and 156,000 beach visits/day; and result in a potential loss of $2.0 -$3.6 million per week.

Spill D: The fourth hypothetical spill occurs at 40°30' North Latitude and 72°20' West Longitude approximately 20 miles offshore (see Map 5D).

The 20 mile impact reaches from Smith's Point County Park on the west to Quogue Beach on the east. Approximately 59 marine facilities, 16 beaches, and 19,000 beach visits/day would be affected. The potential revenue loss would amount to $1.6 - $2.2 Million per week.

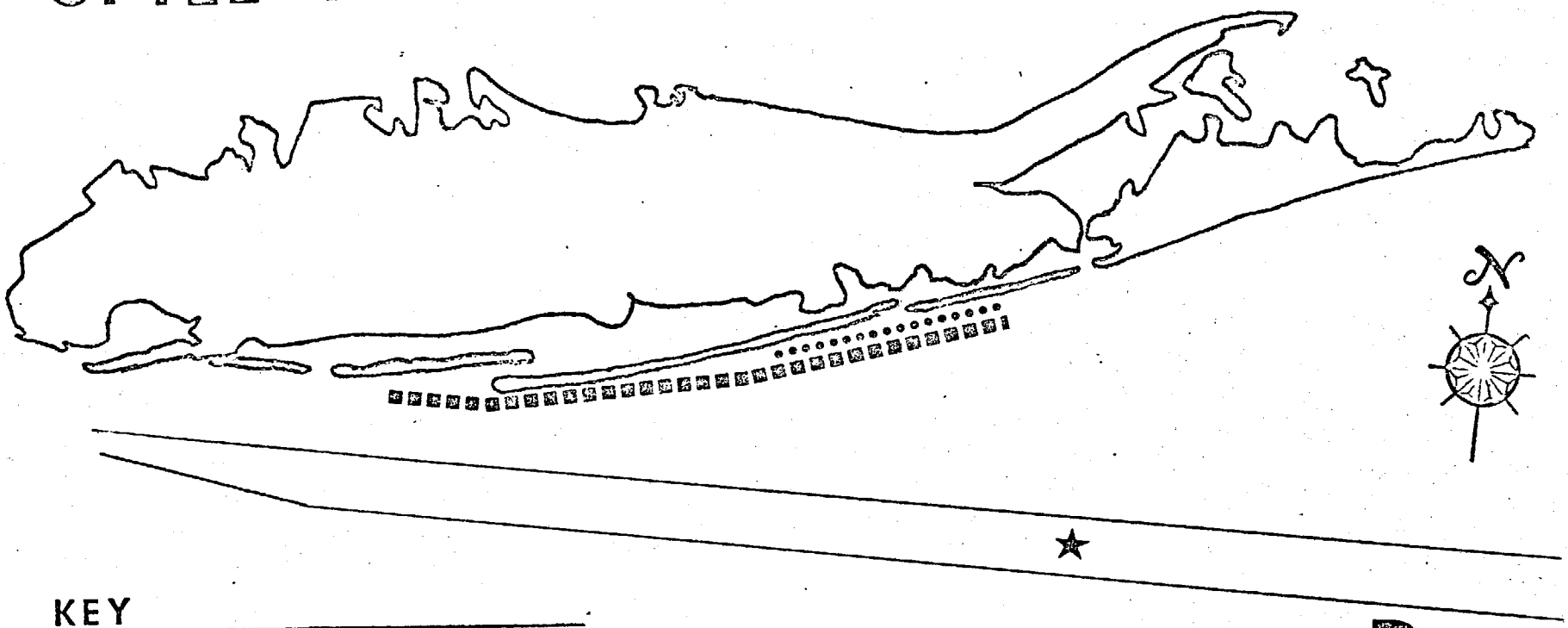
The 60 mile scenario extends from the eastern end of Jones Beach State Park eastward to Quogue Beach. This would impact about 210 marine facilities, 28 beaches, and 102,250 beach visits/day; along with a potential revenue loss of $2.7 -$4.4 million per week.

Spill E: The last hypothetical spill is located at 40°30' N Latitude and 71°30' W Longitude, approximately 26-28 miles from Long Island (See Map 5E).

Due to prevailing winds and currents during this season, it is considered unlikely that a medium spill would have a measurable impact on Long Island.

MAP 5D

SPILL IMPACT AREAS



KEY

☆ SPILL LOCATION

••••••• MEDIUM SPILL IMPACT AREA

▪▫▫▫▫ LARGE SPILL IMPACT AREA

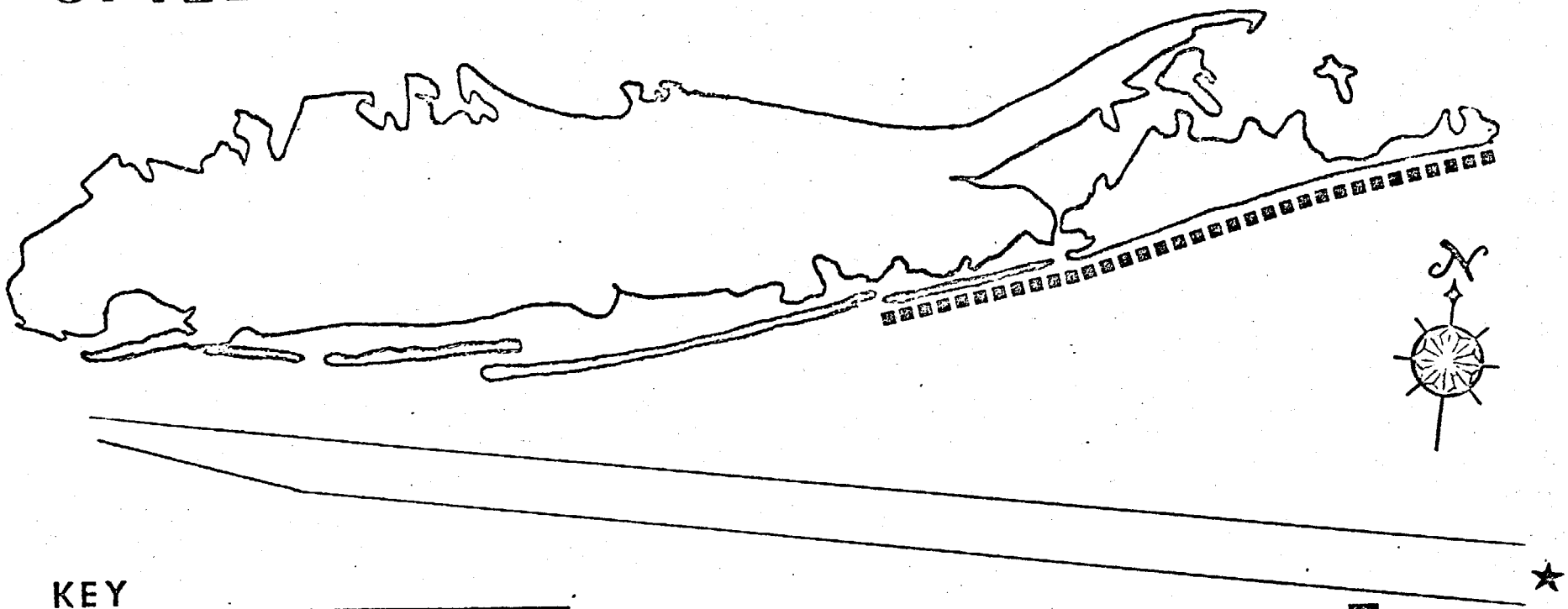
SPILL NO. D

0 16 32

MILES

MAP 5E

SPILL IMPACT AREAS



KEY

☆ SPILL LOCATION

••••••• MEDIUM SPILL IMPACT AREA

▪▫▪▫▪▫▪ LARGE SPILL IMPACT AREA

SPILL NO. E

0 16 32

MILES

The 60 mile impact also has a low probability but could potentially affect the shoreline from Moriches Inlet on the west to Montauk Point. The largest weekly revenue loss would occur here; a range of $8.9 to $13.3 million. The impact on recreation would be to 127 marine facilities, 46 beaches, and 77,000 beach visits/day.

Table 5A

Estimated Weekly Impact of Oil Spills

(thousands of dollars)

Spill Area	Weekly Recreational Spending In Impacted Area		Weekly Revenue Losses	
	Medium Spill	Large Spill	Medium Spill (20 miles)	Large Spill (60 miles)
A	$1980	$7412	$ 423 - 890	$1992-3618
B	2506	6514	569 -1150	1684-3133
C	2925	7412	1232 -1740	1992-3618
D	3591	8509	1561 -2170	2682-4430
E	no impact	23667	negligible	8890-13326

Table 5B

Facilities Impacted

Spill Area		Medium Spill	Large Spill
A	Marine Facilities	197	375
	Beaches	13	41
B	Marine Facilities	197	272
	Beaches	13	28
C	Marine Facilities	45	272
	Beaches	12	28
D	Marine Facilities	59	210
	Beaches	16	34
E	Marine Facilities	0	127
	Beaches	0	46

POTENTIAL ECONOMIC EFFECTS

The losses to Long Island's recreation and tourist industry which may be incurred as a result of an oil spill are directly related to the extent of the impact on the region's ocean beaches. Some 38 million people a year visit ocean facilities in Nassau and Suffolk, and spend approximately $200 million. Any event which interferes with recreation on regional ocean beaches would have a serious impact on Long Island's economy. New York City, with beach visitations of twenty to thirty million, also stands to be significantly affected.

Given the fixed supply of ocean beaches in the Nassau/Suffolk area, spill-induced beach closings could potentially cause a decrease in demand for regional recreational resources. An overall decrease in demand would most likely indicate that many beach users chose to recreate outside of Long Island. Demand would be lowered if the effect of the spill was to divert potential beach users away from Long Island. In June, 1976, the waste pollution problem which forced the temporary closing of most of Long Island's ocean beaches resulted in losses to the regional economy of over $25 million. Much of this was due to the fact that a large number of potential beach-goers spent their free time and money elsewhere.

In contrast, it was concluded (Sorenson & Mead, 1970) that the famed Santa Barbara oil spill of 1969 caused negligible damage to area tourism because many tourists and recreators were diverted to other local facilities, whose gains offset Santa Barbara's losses.

The relatively low loss estimates for the Santa Barbara experience may be explained by both the year-round beach season and the large

number of available beaches. Unfortunately, the former condition does not apply to Long Island. With the actual ocean-bathing season on Long Island lasting only three months, the loss of even a few ocean beaches for one or two weeks could have a considerable effect on the economy.

Water-front property, both residential and commercial, is often valued at five to ten times that of inland property. A major effect of oil spills is the depreciation of water-front property value which is manifested in reduced property tax revenues and diminished aesthetic value.

Another factor to be considered is the portion of the clean-up costs which must be borne by the impacted locality and its residents, or the operating agency of a public facility.

Society can also experience losses which cannot be measured only in terms of dollars. Some of these social costs would be:

- Diminuation of the recreational value of beach experiences to area residents and visitors.
- Coastal environment unavailable for educational and ecological uses.
- Health risks and reluctance on the public's part to return to beaches or consume sea-food products.
- Long term damages to ecosystems and the marine environment in general.

The above are examples of negative externalities which may result from an oil spill.

FINDINGS & CONCLUSIONS

1. The Nassau-Suffolk Region is the State's second most popular tourist area, after New York City.

2. The Atlantic Ocean is the Region's single biggest attraction, bringing some 38 million visitors annually to Long Island's 80 south shore ocean beaches.

3. Annual tourist and recreation spending on Long Island contributes approximately $1.42 billion to the regional economy. This figure accounts for total spending within the region after the application of a 2.85 spending multiplier.

4. Beach-related spending accounts for over one-half of the total regional recreation spending - $257.3 million out of a total of $497.7 million in direct annual expenditures.

5. On an average summer day, approximately 233,000 persons visit ocean beaches in Nassau & Suffolk, spending a total of $1.554 million/day.

6. Boating and sport fishing within the region account for approximately $180.5 million in direct expenditures annually.

7. The far eastern portion of Long Island attracts the region's largest volume of recreational spending - $164.8 million over the summer season. The State Park Sector, including Jones Beach and Robert Moses State Parks, is the most heavily utilized, with an average daily attendance of 89,000.

8. Long Island's summer season is approximately 18 weeks in length, running from mid-May to mid-September. Peak attendance levels at area beaches are reached in early July, and continue through Labor Day. This is a relatively short season when compared to that of states such as California, therefore making it more vulnerable to short-term diaste

9. Proposed OCS activities include no provisions for the development of major onshore support facilities to be located in Queens, Nassau, or Suffolk. Therefore, the primary threat to the region's ocean recreation industry is posed by the transport of oil to and from refineries in the Port of New Jersey and New York.

10. Of the nearly 2,400 tankers that put into the Port of New York and New Jersey annually, fully one-third utilize the Ambrose-Nantucket route, which parallels Long Island's south shore. OCS activities on the Georges Bank and the Baltimore Canyon are expected to generate an additional 730 round-trips between these sites and the Port of New York and New Jersey. One-half of these will be made along the Ambrose-Nantucket route.

11. A medium-to-large oil spill occurring adjacent to Long Island and within the Ambrose-Nantucket route, could potentially wash ashore Long Island beaches, resulting in losses to the regional economy of between $423,000 and $13.3 million per week.

12. It is estimated that a spill classified as "medium" in size (500-1000 barrels, according to US Coast Guard standards) would impact some 20 miles of shoreline. A "large" spill (over 1000 gallons) would impact 60 miles of shoreline. Rather than base hypothetical losses on volumes of oil spilled, they are measured in terms of miles of beach-front effected and the length of impact time.

13. At peak production, approximately one half of the Baltimore Canyon's daily oil production of 320,000 barrels will be transported to existing refineries in the Port of New York and New Jersey area for processing, while the remainder will be transported to facilities in the Philadelphia area.

14. Because there are no refineries in New England, it is expected that Georges Bank oil will be transported to facilities in the Port of New York and New Jersey for processing. These facilities have a combined daily processing capacity of 450,000 barrels. This oil will be transported by tanker along the Ambrose-Nantucket route - a distance of about 275 miles.

15. Chronic oil spills, those occurring as normal by-products of day-to-day OCS development activities, are expected to pose a serious threat to Long Island's marine-related recreation industry. Routine tank cleansing operations at sea result in the flushing of thousands of gallons of oil and solvent into sea lanes which may pass within a few miles of beaches and other water-front properties. Issues raised relevant to these spills concern the ultimate payment of clean-up costs, the environmentalists' claim that the buildup of oil in coastal waters damages marine life for years to come, and decreases in shorefront property values.

APPENDIX

WATER-ORIENTED RECREATION
DATA SHEET

LONG ISLAND REGION

1. Tourism & Recreation Spending

Tourist and recreation spending on Long Island generate approximately $1.5 billion annually. Spending is distributed as follows:

COMPONENT	ANNUAL L. I. SPENDING	With 2.85 SPENDING MULTIPLIER
Beach Visitation & Tourism	$257.3 million	$ 733.4 million
Boating	96.0 "	274.0 "
Sports Fishing	84.5 "	240.8 "
Private Clubs	60.0 "	171.0 "
TOTALS	$497.7 million	$ 1,419.2 million

Beach visitation and tourism on Long Island's south shore accounts for approximately $197 million in annual expenditures before the 2.85 spending multiplier is applied.

County spending is broken down as follows:

	NASSAU COUNTY	SUFFOLK COUNTY
Beach Visitation & Tourism	$ 18.0 million	$ 239.3 million
(w/multiplier)	51.3 "	682.0 "
Boating	36.5 million	59.5 million
(w/multiplier)	104.0 "	169.6 "
Sports Fishing	8.5 million	76.0 million
(w/multiplier)	24.2 "	216.6 "
Club Membership	31.7 million	28.3 million
(w/multiplier)	90.3 "	80.7 "
TOTALS	94.7 million	403.1 million
(w/Multiplier)	$269.9 million	$1,148.8 million

2. Number of Recreators

The average number of people recreating on Long Island (Nassau & Suffolk Counties) on any given summer day is approximately 500,000. We consider this to be a conservative figure. Annual beach visitation to south shore facilities is about 38 million, with seasonal (18 weeks) beach visitation being aroung 29 million.

The average daily south shore beach attendance is 233,000, resulting in weekly expenditures of some $10 million.

The annual beach attendance for all of Long Island is 50.6 million. Including beaches in Brooklyn and Queens, annual attendance is approximately 70 million.

About 32% of all recreators on Long Island utilize State Parks.

3. Basic Economics

L.I. Regional Product	$19.6 million
L.I. Recreational Spending	1.42 million
Nassau/Suffolk Resident Spending	.927 million
Tourist Spending	.426 million

4. Employment

There are approximately 67,500 leisure-related jobs on Long Island. These represent about 8.5% of all jobs in the region - both permanent and seasonal.

5. Regional Recreation Facilities

* Approximately 650 marine facilities (marinas, public and private docks and ramps, and fishing stations). Of these, 403 are in Suffolk and 247 in Nassau. About 416 of these marine facilities are located on the south shore.

* There are over 80 ocean beaches located in Nassau and Suffolk Counties. Both Long Beach and Atlantic Beach in Nassau County are actually made up of dozens of ocean beaches. For the purposes of this report, they are each counted as one beach.

* Of the 247 charter and party fishing centers located along the ocean shore, 222 are in Suffolk County (90%) and 25 are in Nassau.

6. Geography

Long Island has over 530 miles of coastline, not counting the north shore of the barrier beaches. Nassau and Suffolk Counties have 118 miles of ocean shoreline, of which almost one-half are publicly owned.